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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 90 of the	)	PR Docket No. 93-61
Commission's Rules to Adopt	)	
Regulations for Automatic Vehicle	)	
Monitoring Systems	)	

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Petition for Reconsideration

Amtech Corporation ("Amtech"), by its attorneys, pursuant to Section 1.429 of the Commission's Rules, 47 C.F.R. § 1.429 (1995), respectfully seeks limited reconsideration of the Commission's *Order on Reconsideration* ("*Order*") adopted March 18, 1996, in the above proceeding.[1]

I. Introduction and Summary

The Commission's *Order* generally made needed refinements in the regulatory treatment of non-multilateration Location and Monitoring Service ("LMS") licensees and equipment manufacturers.[2] As the world's pioneer in and leading manufacturer of non-multilateration LMS

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[1]A summary of the *Order* was published at 61 Fed. Reg. 18981, April 30, 1996.

[2]Amtech technology grew out of a development effort originally undertaken by the federal government at the Los Alamos National Laboratory. With headquarters in Dallas, Texas, Amtech operates its primary manufacturing and research facilities at Albuquerque, New Mexico. Amtech tags are used on more than two million road vehicles and on virtually all of the 1.5 million rail cars and locomotives in the United States. Amtech technology supports a host of national and international standards employed for the electronic identification of vehicles. Systems using Amtech technology are employed in Asia, Europe, and North America.

equipment, Amtech urges the Commission to continue fine-tuning these rules in order that the 902 - 928 MHz band may support a variety of users in an efficient manner.

The Commission should reconsider the amendments to the emission mask specifications in Section 90.209 ("Bandwidth Limitations") in order to revise the standard as it applies to transmitters with less than two watts output power to stipulate 43 + 10 Log(P) attenuation in keeping with the standard set forth in Section 90.209(c)(1)(iii). In addition, the language of the rule should be revised to conform with that originally adopted in the *Report and Order*, 10 FCC Rcd 4695 (Feb. 6, 1995), wherein the attenuation applied at the edge of the licensee's LMS sub-band.

When addressing issues on reconsideration from the *Order*, the Commission should grandfather indefinitely the non-multilateration LMS licensees first licensed on or before February 3, 1995, by requiring such licensees to change frequency to relocate to a non-multilateration sub-band only in those situations in which such disruptive changes are needed in order to resolve interference to multilateration systems. The Commission should also make provision for those situations in which non-multilateration licensed systems need to be placed at heights more than 15 meters above ground in order to meet important needs such as toll collections at elevated highway intersections and use at dockside by cranes that load and unload containerized cargo from ships as part of intermodal shipping involving ships and/or trains and trucks.[3]

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[3]Amtech addressed these issues in its Petition for Partial Clarification and Reconsideration ("Amtech Petition") filed April 24, 1995. Amtech reasons that these issues were not treated in the instant *Order* because that decision was directed to matters most directly affected by the April 1, 1995, deadline imposed in the *Report and Order*.

II. The Out-of-Band Emissions Requirements Should Provide Reasonable Suppression of Undesired Signals Without Imposing Undue Costs.

The *Order* failed to address Amtech's recommendation that the attenuation for out-of-band emissions produced by non-multilateration transmitters of two watts or less be specified as 43 + 10 Log(P) rather than 55 + 10 Log(P).[4] The standard proposed by Amtech is that employed in Section 90.209(c)(1)(iii) of the Rules as a general limit for systems that can have greater height and power than non-multilateration systems. This same limit has been employed for years by Amtech as a standard of good engineering practice. In considering the applicable standard, the Commission should note that non-multilateration systems are limited to a maximum effective radiated power of 30 watts with relatively low height (15 meters above ground level). As such, non-multilateration systems are inherently designed short range operations of less than line-of-sight in nearly all situations. The very nature of these systems and their intended uses limit the interference potential of such systems.

Use of the 55 + 10 Log(P) standard also imposes significant costs without a demonstrable offsetting benefit. In designing its SmartPass™ reader to meet the new standard, Amtech found that compliance added 21% to the total product cost. Notably, the greater engineering challenge was not in the suppression of emissions that fell immediately outside the LMS sub-bands, but in the suppression of harmonic energy at the output of the transmitter. The application of the

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[4]Amtech Petition at 14.

55 + 10 Log(P) standard to such harmonic suppression offers virtually no additional interference protection because Amtech (and most other non-multilateration systems) employ directional antennas that are typically canted downward. Directional antennas designed to exhibit gain in the 902 - 928 MHz band would not be expected to be efficient radiators at harmonic frequencies.[5] In sum, while additional suppression of unwanted emissions may be justified in some situations, use of the 43 + 10 Log(P) for transmitters of two watts output or less should prove adequate for non-multilateration LMS transmitters.

Regardless of whether the Commission changes the amount of suppression required, it should revert to the original language of Section 90.209 as adopted in the *Report and Order* insofar as the suppression of emissions from non-multilateration systems is concerned. In its *Order* the Commission stated that it was changing the emission mask applicable to multilateration equipment but that "[a]ll other equipment to operate in the LMS will remain subject to the emission mask we adopted in the *Report and Order*."[6] Section 90.209(m) as adopted in the *Report and Order* required suppression in accordance with the following

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[5]Even if there were signals actually radiated at the harmonic frequencies, the signals entering the antenna would be suppressed by more than 43 dB (a factor of over 20,000:1), be radiated through an antenna that would likely exhibit negative gain at the harmonic frequencies and normally not directed at the horizon or transmitted from a high height.

[6]*Order* at ¶ 25.

schedule:

> (1) On any frequency within the authorized bandwidth: Zero dB.
>
> (2) On any frequency outside the licensee's LMS sub-band edges (as identified paragraph (m)(5) of this section: 55 + 10 Log(P) where (P) is the highest emission (watts) of the transmitter inside the licensee's LMS sub-band.[7]

Notwithstanding the policy announced in the *Order* of not changing the emission mask for non-multilateration equipment, the new rules adopted on reconsideration dramatically changed the emission mask. The requirements now apply the 55 + 10 Log(P) standard at the edge of the "authorized bandwidth." Curiously, the revised Section 90.209 still provides that emissions within the authorized bandwidth are subject to a zero suppression requirement. While making emissions within the authorized bandwidth subject to zero suppression provides designers with needed flexibility, imposition of a "brick wall" filter response immediately outside the authorized bandwidth requires that emissions begin to be suppressed significantly within the authorized bandwidth. Amtech suspects that this change may have simply been the sort of drafting error that sometimes occurs in the preparation of complex documents, particularly in a case such as this in which the Commission was responding to the requests of the multilateration interests for relief from what was perceived by that portion of the LMS industry to be an overly restrictive standard.[8]

The fact that the LMS sub-bands are not channelized underscores the reasonableness of

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[7]*Second Erratum* in Dkt. PR 93-61 at 7 (rel. Mar. 1, 1995), 10 FCC Rcd 12735.

[8]The changes in the relevant portion of Section 90.209 are illustrated in Attachment 1 hereto. Attachment 1 is a "redline" version of the rule as adopted in the *Order* compared with that of the *Report and Order*. Attachment 2 shows Amtech's proposed revised rule with 43+10 Log(P) attenuation for transmitters with two watts or less output power.

the approach followed by the Commission in making the specified attenuation applicable at the relevant sub-band edges rather than at the edge of the "authorized bandwidth." In a channelized environment, suppression by a specified amount at the edge of the authorized bandwidth makes sense. The LMS, however, is not a channelized service and need not be if a variety of approaches are to be employed so that technology can continue to evolve. Accordingly, by applying the rule to specify a given amount of attenuation at the sub-band edge, the Commission accorded needed flexibility while maintaining a check on the effects of undesirable emissions falling within neighboring sub-bands. This flexibility should be maintained by returning to the original language insofar as the application of the attenuation standard is concerned.

Conclusion

The LMS proceeding has been a challenge for all. The Commission has faced difficult issues with the goal of fairness and a sense of the overall public interest as it has worked to balance many competing interests. Amtech appreciates this effort and urges the Commission to move forward in finalizing these regulations consistent with the revisions recommended herein.

Respectfully,

Amtech Corporation

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Attachment 1

Changes Made to Section 90.209 as it Applies to Non-Multilateration Operations

* * * * *

~~(m) For~~ **(3) *Other transmitters.* For all other** transmitters authorized under Subpart M ~~that operate in the 902-928 MHz band~~, the peak power of any emission shall be attenuated below the power of the highest emission contained within the ~~licensee's LMS sub-band~~ **authorized channel bandwidth** in accordance with the following schedule:

~~(1)~~**(i)** On any frequency within the authorized bandwidth: Zero dB~~.~~**;**

~~(2)~~**(ii)** On any frequency outside **of the authorized bandwidth: 55 + 10log(P)** ~~the licensee's LMS sub-band edges (as identified inparagraph (m)(5) of this section): 55 + 10 log(P)~~ dB where (P) is the highest emission (watts) of the transmitter inside the ~~licensee's LMS sub-band~~ **authorized bandwidth.**

~~(3)~~**(4)** The resolution bandwidth of the instrumentation used to measure the emission power shall be 100 kHz**, except that, in regard to paragraph (2) of this section, a minimum spectrum analyzer resolution bandwidth of 300 Hz shall be used for measurement center frequencies within 1 MHz of the edge of the authorized subband**. If a video filter is used, its bandwidth shall not be less than the resolution bandwidth.

~~(4)~~**(5)** Emission power ~~(P)~~ shall be measured in peak values.

~~(5) The LMS sub-band edges for multilateration systems for which emissions must be attenuated are 904.00, 909.75, 919.75, 921.75, 927.50, 927.75 and 928.00 MHz. If the 919.75-921.75 and 921.75-927.25 MHz sub-bands are aggregated by a single licensee, the emission mask limitations at the band edges at 921.75 and 927.50 MHz may be ignored. The LMS sub-band edges for non-multilateration systems for which emissions must be attenuated are 902.00, 904.00, 909.75 and 921.75 MHz.~~

Attachment 2

Proposed Revised Portion of Section 90.209

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(3) *Other transmitters.* For all other transmitters authorized under Subpart M, the peak power of any emission shall be attenuated below the power of the highest emission contained within the licensee's LMS sub-band in accordance with the following schedule:

(i) On any frequency within the authorized bandwidth: Zero dB

(ii) On any frequency outside the licensee's LMS sub-band edges (as identified in paragraph (m)(6) of this section): 55 + 10 log(P) dB where (P) is the highest emission (watts) of the transmitter inside the licensee's LMS sub-band, provided that a maximum of 43 + 10 Log(P) of attenuation shall be required for non-multilateration transmitters with a maximum output power of two watts or less, where (P) is the highest emission (watts) of the transmitter inside the licensee's LMS sub-band.

(4) The resolution bandwidth of the instrumentation used to measure the emission power shall be 100 kHz, except that, in regard to paragraph (2) of this section, a minimum spectrum analyzer resolution bandwidth of 300 Hz shall be used for measurement center frequencies within 1 MHz of the edge of the authorized sub-band. If a video filter is used, its bandwidth shall not be less than the resolution bandwidth.

(5) Emission power shall be measured in peak values.

(6) The LMS sub-band edges for non-multilateration systems for which emissions must be attenuated are 902.00, 904.00, 909.75 and 921.75 MHz.